What is claimed is:

1- A method for fabricating polysilicon structures on a semiconductor substrate including the steps of:

a) depositing a polysilicon layer on the substrate;

c) depositing on the polysilicon layer an antireflective coating comprising a bilayer of inorganic films having thicknesses, extinction coefficients, and refractive indices which allow less than 1% reflection radiation at a wavelength of about 193 nm;

c) depositing a photoresist over the antireflective coating;

d) exposing selected portions of the resist to radiation of about 193 nm wavelength;

e) developing the resist to create a resist mask defining and protecting portions of said anti-reflective coating;

f) patterning said bilayer antireflective coating to form a hard mask, thereby exposing selected areas of said polysilicon;

g) removing the photoresist;

h) etching to remove the exposed polysilicon,

i) etching to remove the second or top layer of anti-reflective hard mask; and

j) removing the first or bottom layer of hard mask simultaneously with the polysilicon clean-up process.

2- A method as in claim 1 wherein said anti-reflective coating comprises a first layer of silicon rich nitride, and a second layer of silicon oxynitride,

3- A method as in claim 1 wherein the thickness of the first layer of said antireflective coating is between 300 and 1500 angstroms, and the second layer is in the range of 170 to 330 angstroms.

4- A method as in claim 1 wherein the extinction coefficient of said second layer is in the range of 0.3 to 0.4.

5- A method as in claim 1 wherein the extinction coefficient of said first layer of the antireflective coating is in the range of 0.77 to 1.07.

6- A method as in claim 1 wherein the polysilicon thickness is in the range of 1200 to 2500 angstroms.

7- A method as in claim 1 wherein said antireflective coatings are deposited by plasma enhanced chemical vapor deposition.

8- A method as in claim 1 wherein said post polysilicon etch utilizes phosphoric acid.

9- A method as in claim 1 wherein said photoresist, selected areas of said antireflective coating, and selected areas of said polysilicon are removed in-situ in the same plasma etch chamber.

10- A method as in claim 1 wherein silicon nitride is rapidly removed by phosphoric acid at a rate of about 100 angstroms per minute.

11- A method as in claim 1 wherein said photoresist is about 2000 to 3000 angstroms thickness.

12- A method for making an inorganic antireflective coating having less than 1% reflection at 193 nm wavelength, comprising the steps of:

depositing an antireflective bilayer directly on a reflective substrate, said bilayer comprising silicon rich silicon nitride and silicon oxynitride.

13- The method as in claim 12 wherein said reflective substrate comprises polysilicon.

14- The method as in claim 12 wherein the step of forming an antireflective bilayer comprises a first layer having an extinction coefficient in the range of 0.77 to 1.07, and the second layer having an extinction coefficient in the range of 0.3 to 0.4.

15-A method as in claim 12 wherein the thickness of said first layer is greater than 300 angstroms, and the thickness of said second layer is in the range of 170 to 330 angstroms.

16- A method of forming an inorganic hard mask for protecting selected areas of polysilicon during an

etching to form a semiconductor device comprising the steps of:

providing a substrate with a layer of polysilicon;

depositing layer of silicon rich silicon nitride atop the polysilicon;

depositing a layer of silicon oxynitride over the silicon nitride;

depositing a layer of photoresist over the silicon nitride;

exposing selected areas of said photoresist to ultraviolet radiation;

developing the resist to create a resist mask;

etching unmasked portions of the silicon oxynitride and silicon nitride;

removing the resist, and etching to remove the silicon oxynitride and exposed portions of polysilicon; and

removing the silicon nitride employing the phosphoric acid clean-up of polysilicon.

17- A method as in claim 16 wherein the hard mask is an anti-reflective coating having less than 1 % reflection.

18- A method as in claim 16 wherein the silicon nitride layer is rapidly etched by phosphoric acid.

19- An anti-reflective coating comprising a bilayer of silicon rich silicon nitride in the range of 300 to 1500

angstroms thickness, and a layer of silicon oxynitride in the range of 170 to 330 angstroms thickness.

20- An antireflective coating as in claim 19 wherein the extinction coefficient of the silicon nitride layer is in the range of 0.77 to 1.07, and the silicon oxynitride extinction coefficient is in the range of 0.3 to 0.4.

21- An antireflective coating as in claim 19 wherein reflectivity is less than 1% at 193 nm wavelength exposure.